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ABSTRACT

Two institutions of higher learning in Oklahoma have successfully implemented an interactive computer-video system of instruction in their basic communication courses. The system will be made avaliable to other institutions. Four learning principles and their implementations comprise the heart of this system including behavioral objectives, mastery learning, individual prescription, and modular flexibility. Additionally, computer-video technology has allowed instruction to be specifically tailored to the learner and has evidenced five immediate, important benefits: (1) it helped instructors individualize leaning experiences for students; (2) it helped provide multi-channel stimulation during the learning experience; (3) it helped orient the novice graduate teaching assistant and part time instructors to course content and assignments; (4) it helped update experienced teaching assistants and full time faculty; and (5) it helped facilitate the creation of innovative teaching materials through the cooperation of students, teaching assistants, part time faculty, and senior staff. Finally, experience with this system indicates that the central role of the instructor is not diminished. (One chart is included; 53 references are attached.) (KEH)

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THE DEVELOPMENT AND IMPLEMENTATION OF INTERACTIVE, COMPUTER-VIDEO LEARNING TRACKS FOR THE BASIC COURSE

ABSTRACT

This document discusses how an Interactive, Computer-Video option will be provided in communication courses for students attending two of Oklahoma's institutions of higher education. After piloting the project at Oklahoma State University and Tulsa Junior College, the option will be made available at other institutions. As of September 26, 1990, prototypes of 32 of the 48 Speech Communication Interaction Program (SCIP) modules had been constructed.

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THE DEVELOPMENT AND IMPLEMENTATION OF INTERACTIVE,
COMPUTER-VIDEO LEARNING TRACKS
FOR THE BASIC COURSE

This document discusses the rationale, benefits, and current status of interactive, computer-video in the basic communication courses at two of the state's institutions of higher learning, Oklahoma State University and Tulsa Junior College. The discussion section of the paper touches on some of the implications of the system of instruction.

Sometimes called "interactive video" in the literature (Jones & Smith, 1989), interactive, computer-video goes beyond the typical application of computer-assisted instruction. Usually, computer-assisted instruction resembles the pages of a programmed-learning workbook put on the screen of a computer monitor. The student makes responses through the use of a keyboard, mouse, or touch-screen and receives immediate feedback. This tool excels in drilling a student on concepts and principles.

With the addition of computer-controlled video (and audio) supplied by a VCR or videodisc player, lessons become as engaging as a NASA, Man-in-Space training session or an addictive video-arcade game. Any sight and sound, any action, that can be recorded can become a part of a course lesson. This tool excels in gaining and maintaining student involvement.

The computer-video option puts the learner and the instructor at the center of the learning experience. The computer and video gives

CHOICES to the learner and instructor. The learner and instructor can choose from a variety of ways to learn material; they are in control of the learning experience. Sights and sounds from a thousand miles away and decades ago are instantly accessible.

A congressional debate from C-Span on a presidential appointment, Kennedy's "Ask Not" speech, and Martin Luther King, Jr.'s "I Have a Dream" are all but a key-stroke away. Simulated conversations with Plato and Aristotle and the student about the ethics of rhetoric boot-up at the click of a mouse. The classroom is no longer confined to four walls; it is limited only by the imagination of the learner and instructor.

Until now interactive, computer-video systems have been too expensive for many applications. Software, alone, for authoring the lessons has cost as much as $50,000. The hardware for a simple, learning station has cost at least $10,000. NASA, other government agencies, and Fortune 500 companies have been able to afford interactive, computer-video. Universities like the University of Illinois (Jones & Smith, 1989) and Michigan State University (SALT conference on interactive video, 1988) have gained leadership in the academic area through grants that have reduced cost barriers.

Today, at the minimum, the interactive computer-video option requires a single learning station consisting of a personal computer like the Amiga 500, a VCR, a gen lock, video tapes, an infared controller, and appropriate software. Retail cost for an authoring system is under $200. Currently the retail price for this minimal configuration is $2,499. However, the option permits the use of high-end laser, videodisc technology and has this capability built into the software. Because of its cost effectiveness, institutions with limited

resources can realize the benefits of the option. Because of its compatibility with laser disk systems, institutions are not locked into an option that that will become outdated.

RATIONALE

Speech 2713 is a logical course to serve as a startup program for an interactive, computer-video approach. As a participant in a university-wide project funded by the National Science Foundation, the Department of Speech Communication revamped its basic course in the 1970's. The Preprofessional Individually Paced Instruction (PIPI) project incorporated four learning principles (McCollom & Ford, 1973a, 1973b, 1973c). These four principles and their implementations are at the heart of an interactive, computer-video system.

The course is now based these principles of learning: (1) learning is most efficient when students are fully informed about what is expected of them; (2) learning can occur only when students have the skills and information that are prerequisite to dealing with a new learning task; (3) learning is accomplished in different ways by different students; and (4) learning is facilitated when students work on tasks related to their needs and interests.

To implement these learning principles, the course makes use of Behavioral Objectives, Mastery Learning, Individual Prescription, and Modular Flexibility. The use of behavioral objectives means that the expected observable performance required of the student is stated in concrete terms, and the criteria that should be used to evaluate the student's behavior are stated publicly. Mastery learning is utilized to ensure that students have the skills and information that are prerequisites to dealing with a new learning task. The student and

instructor can prescribe those activities available in the system that will help the learner meet the objectives; the student and instructor can decide on the pace of instruction that is best suited to the student. Modular flexibility allows students and instructors to fit the course of instruction to the needs and interests of the learner. With this system, the instructor's role as an "instructions-giver" becomes minimal and his/her role as a "facilitator" or "partner in learning" is maximized. This approach helps meet two important demands that are often at odds: the demand for accountability and the demand for humanized instruction.

As the result of the PIPI project, Speech 2713 today is ready to realize the advantages of the interactive computer-video system of instruction. The system offers a way of better reaching unrealized goals that have their genesis in the historical development of Speech 2713. The job before us is one of translation, not invention.

Simply put, in the early and mid 70's we did not have the technology to fully implement the concepts of Individual Prescription and Modular Flexibility. We did not have the mechanism to make a variety of learning paths instantly accessible to the learner. Today commercially available computer-video interfaces, such as those based upon the Amiga 500, 2000, and 2500, offer cost-effective mechanisms that allow instruction to be specifically tailored to the learner.

BENEFITS

The computer-video option has five immediate, important benefits:

1. It helps instructors individualize learning experiences for students;
2. It helps provide multi-channel stimulation during the learning experience;

3. It helps orient the novice graduate teaching assistant and part time instructors to course content and assignments in 2713 and 1113;

4. It helps update experienced teaching assistants and full time faculty; and

5. It helps facilitate the creation of innovative teaching materials through the cooperation of students, teaching assistants, part time faculty, and senior staff.

Let us examine in detail the implications of each benefit.

1. The computer-video option helps instructors individualize learning experiences for students.

We expect individualization to lead to higher student achievement and student retention. Educators have long recognized that learners have different ways of collecting and organizing information into useful knowledge. MacKinnon (1978) put it this way:

> The wide range of individual differences surely must mean that there is no single method of nurturing creativity; ideally the experiences we provide should be tailormade, if not for individual students, at least for different types of students. We should remember that the same fire that melts the butter hardens the egg [emphasis added] (p. 171).

When an instructor selects a mode of presentation such as a lecture, he/she is placing definite adaptation demands upon the minds of the students (Gregorc, 1979). For example, a one-hour lecture could require such adaptive qualities as abstract symbol decoding, an aural modality, dependency, separative behavior, deductive reasoning, logical sequencing, the suppression of emotion and immediate verbal response. This example points out the characteristics an individual must possess in order to make efficient use of the lecture mode. The computer-video mode also has distinguishing characteristics that are more appealing to one type of learner than to another.

The learning-style concept (Keefe, 1979, 1987; Gregorc, 1979; Ast,

1988) is important in the movement toward improved college teaching and learning (Claxton & Murrell, 1988). There have been numerous scales and instruments designed to measure individual differences in learning style (e.g. Canfield & Lafferty, 1974; Gregorc, 1984; Kolb, 1976).

Kolb's Learning Style Inventory (LSI) (1976) is one of the most frequently cited learning style instruments in research examining adult learners (Rule & Grippin, 1988; Vondrell & Sweeney, 1989; Katz, 1988; Fox, 1984; Pigg, Busch, & Lacy, 1980). The reliability of the LSI has been studied extensively (Smith & Kolb, 1986; Whitney & Caplan, 1978; Carrier, Newell, & Lange, 1982; West, 1982; Fox, 1984; Freedman & Stumpf, 1978; Korhonen & McCall, 1986; Marshall & Merritt, 1985; Pigg, Busch, & Lacy, 1980; Sugarman, 1985). Critical reviews of the LSI can be found in many sources (Rule & Grippin, 1988; Cornett, 1983; Sewall, 1986; Dunn, 1988).

The LSI divides individuals into four types: Converger, Diverger, Assimiliator, and Accommodator. With the interactive, computer video system at OSU, learning tracks are being developed to address each of these four types. Students can determine their learning styles and choose the most appropriate learning track. Studies show that students who learn in their preferred mode of instruction have significantly higher achievement in the subject matter (James, 1962; Pascal, 1971; Smith, 1976; Smith and Renzulli, 1982).

In addition to higher student achievement, improved student retention may result for the individualization of instruction. Even though attrition studies in Oklahoma point to "financial reasons" as the number one reason for dropping out, other states with similar resources as Oklahoma do not have the attrition problems we have. During the most recent six year period (1983-89), 53% of the freshmen

entering Oklahoma State in 1983 had dropped out, and only 44.2% had graduated (Ivy, 1989).

More than 3,000 students enroll in oral communication courses each year at Oklahoma State and Tulsa Junior College. As many as 20% of the students in specific sections may withdraw from the courses during a term. On the average, at least 5% of the students withdrew from oral communication courses during a term for the past five years; approximately 5% of the students withdrew from all lower-division courses at the institutions during a term. If we could reach only 75 of the 150 students we lose each year and provide them with individualized learning experiences, we may be able to establish learning habits that retain students.

2. The computer-video option helps provide multi-channel stimulation during the learning experience.

Multi-channel learning experiences translate into greater student achievement and student satisfaction. The University of Illinois began implementing an inactive-video system in 1984. Interactive computer-video lessons are being used as laboratory alternatives in introductory chemistry courses for non-majors. Illinois uses a videodisc system.

Evaluations were determined how well students learned from these lessons and how well they liked them. Several studies were conducted (Jones & Smith, 1989). In all cases, significant gains were noted for the students using the videodisc lessons when compared to other modes of learning (Jones, 1987; Smith, Jones, & Waugh, 1986). In the spring of 1987 students were surveyed about the the learning alternative (Smith & Jones, 1987). Overall, 68 percent of those responding stated that they would recommend a course using computer-video lessons to a friend. Students who had used the videodisc system for two semesters

registered even greater favorability. In addition, feedback from instructors has been positive. Jones and Smith (1989) report that their lessons currently are being used successfully in several high schools and community colleges and at other four-year colleges and universities.

3. The computer-video option helps orient the novice graduate teaching assistant and part time instructors to course content and assignments in 2713 and 1113.

Due to the nature of their programs, both OSU and TJC have new teachers constantly entering their instructional systems. The computer-video option allows an instructor to use as much time as needed to learn how to teach the course. In addition, the computer time can be scheduled when the new teacher has time available, not when a senior staff member is available.

4. The computer-video option helps update experienced teaching assistants and full time faculty.

Changes in course content can be communicated effectively and efficiently. An experienced teacher can be refreshed on assignments at his or her convenience.

5. The computer-video option helps facilitate the creation of innovative teaching materials through the cooperation of students, teaching assistants, part time faculty, and senior staff.

Students enrolled in honor sections of the course have the opportunity to work with senior staff and others in the creation of new modules. Because of the flexibility in scheduling time with the computer, small groups of teaching assistants and part time faculty can achieve a level of involvement in the creation of course materials that is not possible now. With a modem, an instructor can interact with other part time instructors from home or place of work.

CURRENT STATUS OF THE COMPUTER-VIDEO OPTION AT OSU AND TJC

Currently, the departments of speech communication at OSU and TJC are developing and testing modules for the interactive, computer-video option. A single work station consisting of a computer and a VCR is being used to create the SCIP (Speech Communication Interaction Program) modules.

Each module is defined by a course component, such as a specific assignment, and a student's need. SCIP modules address three student needs or have three functions: to help the learner (A) learn the material, (B) execute or do an assignment or course task, or (C) evaluate or grade an assignment or course task. The user interface is based on authoring software developed by Inovatronics (CanDo), hypermedia software developed by Poor Person Software (Thinker) and artificial intelligence software developed by Emerald Intelligence (Magellan).

When activated, the computer becomes an Answering Machine for the Department of Speech communication. After a guided tour that explains how to navigate through the menu-driven system, the user is given the options of finding out more about the speech communication major or a specific speech communication course. If the user selects the 2713 option and expresses an interest in finding out more about the graded work in the course, the user is presented with the following choices, along with a brief description of each:

1 Assignments

Project 1 "The Communication Barriers Assignment"
Project 2 "The Interviewing Assignment"
Project 3 "The Speech to Inform"
Project 4 "The Problem-Solving Discussion"
Project 5 "The Persuasive Public Discussion"
Project 6 "The Persuasive Public Speech"

2 Examinations/
Quizzes

3 Outside Reports/
Other graded aspects

Regardless of the user decision, the user is given three options: (A) learning how to do the graded work, (B) executing or doing the graded work, or (C) evaluating or grading the work. Let us examine what happens in each option.

If the student chooses option A, the learning option, the learner is presented with four ways of learning the material. Each mode of learning is based on the learning style model that was discussed earlier.

That is, Computer-Video modules are of four types. The first type of module provides an enrichment opportunity for the student. The second type of module fulfills the same function as a chapter in a book; however, the material can be studied in a linear or nonlinear fashion. The modules are constructed using hypertext software (Bush, 1945; Hypercard contest winners, 1988; Interactive video and hypercard projects at MSU, 1988; Nelson, 1974, 1988; SALT conference on interactive video, 1988). A mouse-click on an unknown word or concept evokes graphics, additional text, VCR presentations, etc. A third type of module serves the function of making assignments like an instructor's lecture on an assignment or a section in a syllabus. The fourth type of module provides drill for the student on both basic concepts and principles from the textbook and the assignment.

Currently, we are referring to a series of modules of a given type as modes of learning. More specifically, we use these terms for the types of modules: (1) the ENRICHMENT mode of learning; (2) the

TEXTBOOK mode of learning; (3) the LECTURE mode of learning; and (4) THE WORKS mode of learning.

If the student chooses option B, the executing or doing option, the student can complete an assignment or part of an assignment by interacting with the computer. For example, the student can enter the plan or outline for an up-coming speech.

If the student chooses option C, the evaluating or grading option, the student can get detailed feedback on how he or she did on an assignment or course task. For example, the student can insert a floppy disk that has the instructor's evaluation encoded on it. The hypertext feature of the evaluation means that the student has access to a paragraph summarizing the instructor's evaluation as well as scores of pages of text describing in detail what the student can do to improve his or her performance.

Let us suppose that another student is interested in the mid-semester examination and wants to take advantage of the learning option, execution option, and evaluation option. She could (A) call up modules that would help her prepare for the exam. She could (B) request the modules that would actually contain the examination questions, and she could respond to the exam using the keyboard or mouse. She could (C) ask the computer to grade the examination and report the results to her. The examination results would be recorded to her course records automatically.

The first phase of the translation project was undertaken in the Spring of 1989. This phase focused on the making of the six assignments as they would be made by the instructor of the course. In terms of Chart 1, the learning modules dealt with the lecture mode for each of the six projects.

As of September 26, 1990, prototypes of 32 of the 48 SCIP modules had been constructed. Project 2 had the full set of four learning modules, an execution module, and an evaluation module. The remaining projects had at least three of the four learning modules. In addition, projects 3, 4, and 6 as well as Exam 1 had prototype versions of execution modules in place. The first version of the modules were low on the Interactive Dimension. They were more like slideshow lectures than discussions. However, interactive opportunities were noted during the construction of the first version of the modules. Current modules have more opportunities for interaction than eariler versions.

Chart 1. A components X function schematic of SCIP modules.

COMPONENTS OF SPCH 2713	MODULE FUNCTIONS		
	A Learning	B Execution	C Evaluation
1 Assignments	1,A	1,B	1,C
Project 1	E T L W		
	X X X X	O	X
Project 2	E T L W		
	X X X X	X	X
Project 3	E T L W		
	X X X X	X	O
Project 4	E T L W		
	O X X X	X	O
Project 5	E T L W		
	O X X X	O	O
Project 6	E T L W		
	X X X X	X	O
2 Examinations/ Quizzes	2,A	2,B	2,C
Exam 1	X	X	O
Exam 2	X	O	O
Quizzes	X	O	O
3 Outside Reports/ Other graded aspects	3,A	3,B	3,C
	O	O	O

[E = ENRICHMENT
T = TEXTBOOK
L = LECTURE
W = the WORKS

X = PROTOTYPE MODULE AVAILABLE (32)
O = MODULE UNDER CONSTRUCTION (16)
AS OF SEPTEMBER 26, 1990]

DISCUSSION

We learned many important lessons in the PIPI project that will serve to guide us in the translation of the 2713 and 1113 courses. The central lesson we learned is that it is the instructor who is central to the success of any instructional system.

Any system that diminishes the central role of the instructor is doomed to failure. The technology must serve to release the instructor to do the things that he/she does best. Consequently, it is the instructor who decides which modules in the matrix presented in Chart 1 best serve him/her. The instructor who is expert in making assignments in a way that produce results would not want to use the LECTURE modules on a routine basis. However, this instructor might want to use them for a student who misses class the day the assignment is made. But maybe this instructor has an exceptional student who can profit from one of the ENRICHMENT modules for an assignment.

The modules must be designed so that they can be modified by the instructor. Although the complete course will be available using Computer-Video modules, it is the instructor who decides how the system will be put together.

A second lesson we learned is that student expectations must not be violated by the instructional system. Students who expect to have "live" lectures in a speech class must have the opportunity to fulfill this expectation. However, the student who enjoys MTV may be reached by an enrichment module in a way impossible through a classroom lecture. Another student may appreciate being drilled by the computer on certain concepts before an exam. The Computer-Video system of instruction is seen as a way of adding options to the learning

experience; it is not designed to replace traditional ways of instructing.

A third lesson we learned is that we are preparing college students for a life-time of learning, not just four years of learning. The system of instruction must develop habits that will help the learner continue the educational process after college. Preparing a student for life-long learning is itself an educational process that is facilitated by the Computer-Video system of instruction. It gives the learner the major responsibility for his or her learning experiences.

We also learned the limitations of relying on a single medium of instruction. Great reliance was placed on written materials in the PIPI program. The danger is to place too much reliance on the computer and video hardware. Although computer literacy is a benefit of using the a Computer-Video system of instruction, the central goals of Speech 2713 and 1113 must focus on human oral communication and how it may be mediated.

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